



# Application Layer Functionality and Protocols



## Network Fundamentals – Chapter 3

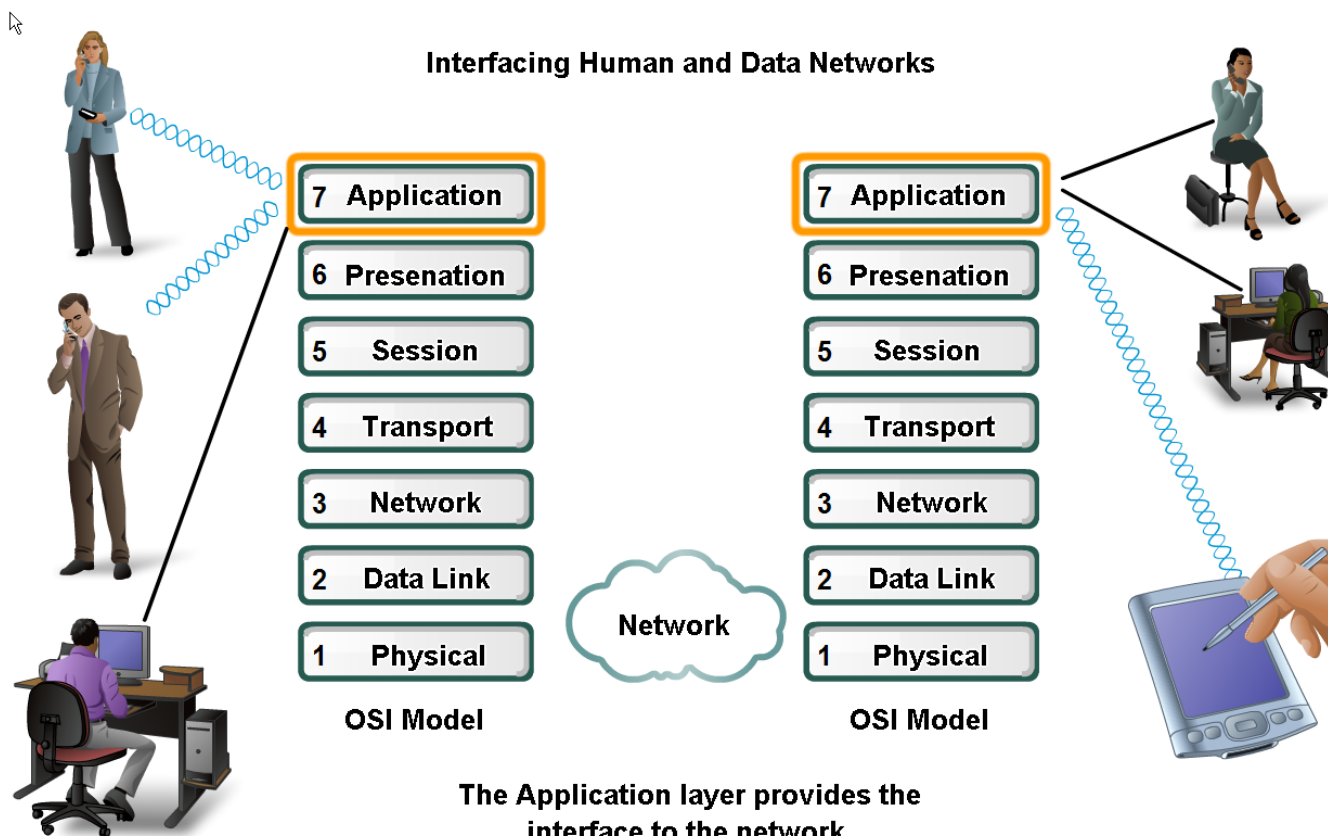
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# Objectives

- Define the application layer as the source and destination of data for communication across networks.
- Explain the role of protocols in supporting communication between server and client processes.
- Describe the features, operation, and use of well-known TCP/IP application layer services (HTTP, DNS, SMTP).

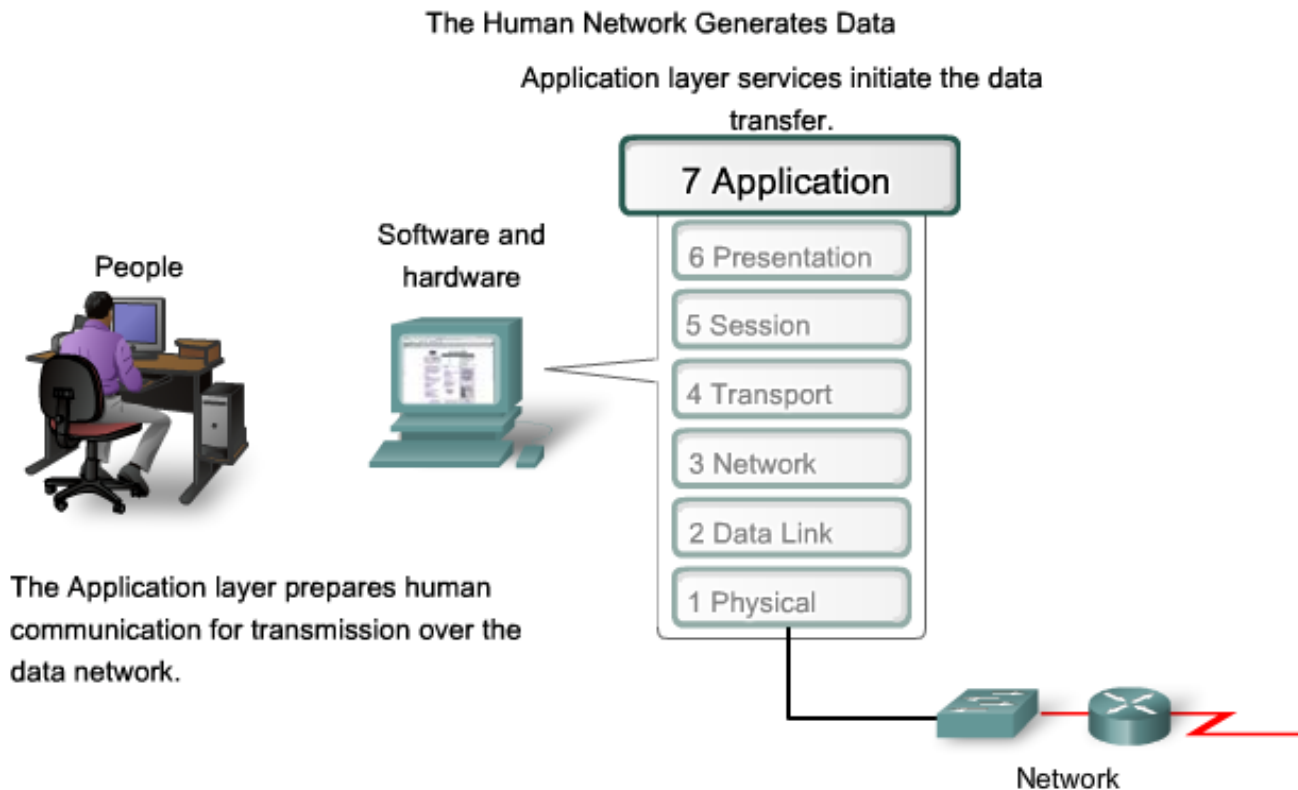
# Applications – The Interface Between Human and Data Networks

- Explain that applications provide the means for generating and receiving data that can be transported on the network



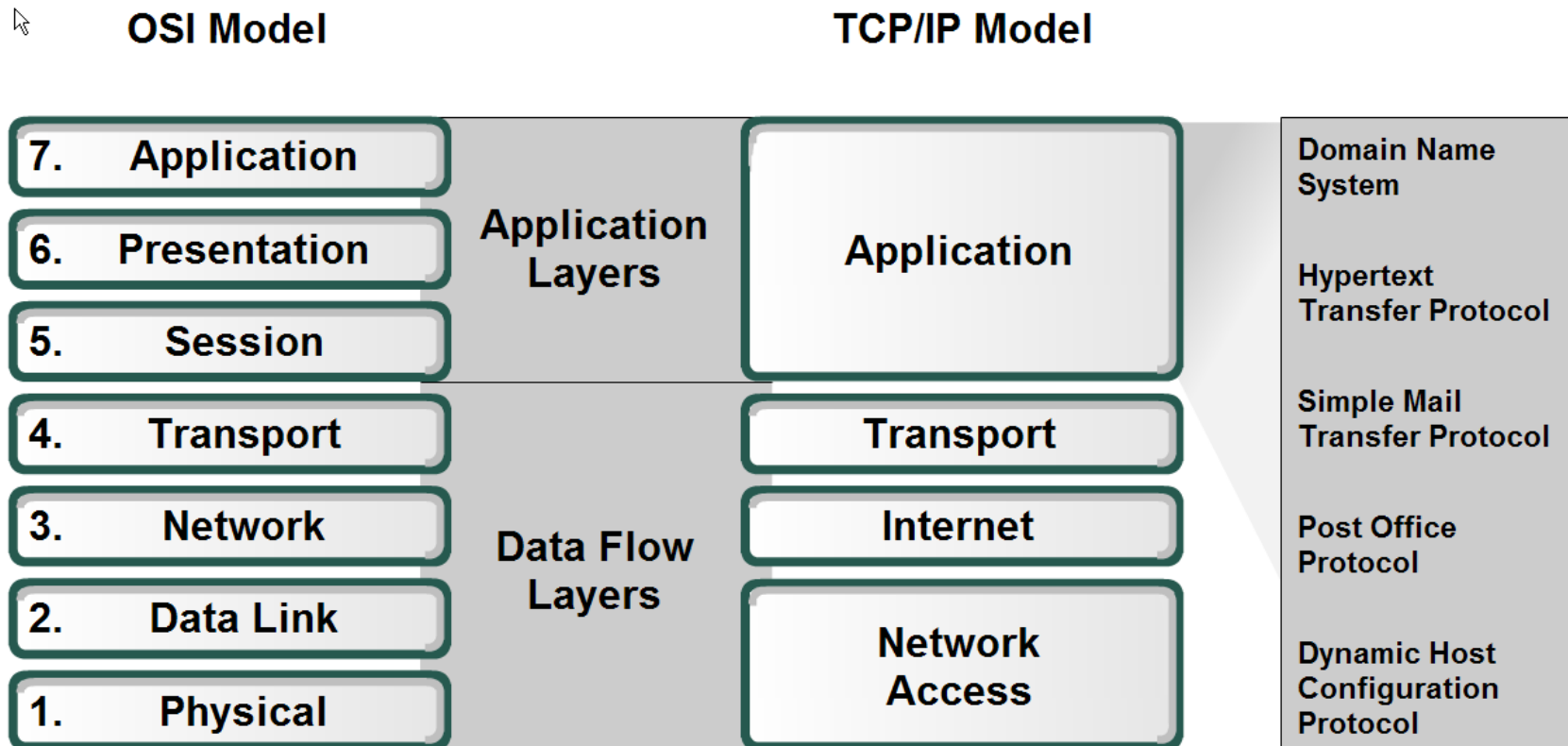
# Applications – The Interface Between Human and Data Networks

- Explain the role of applications, services and protocols in converting communication to data that can be transferred across the data network



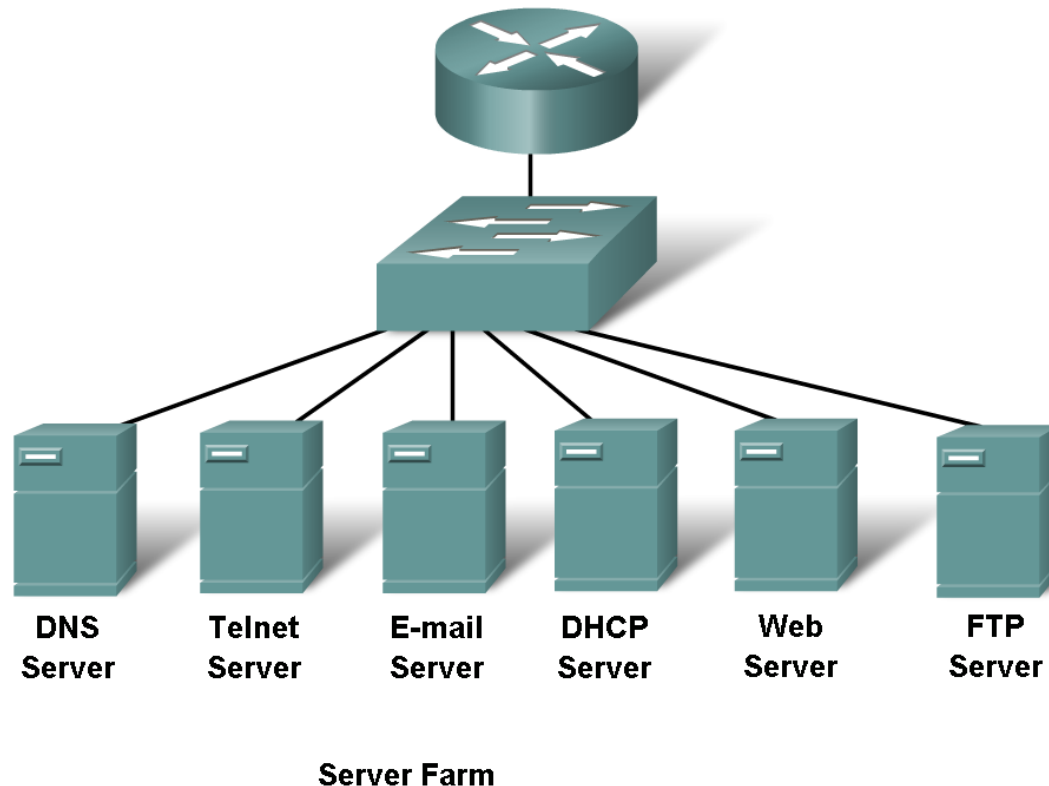
# Applications – The Interface Between Human and Data Networks

- Define the separate roles applications, services and protocols play in transporting data through networks



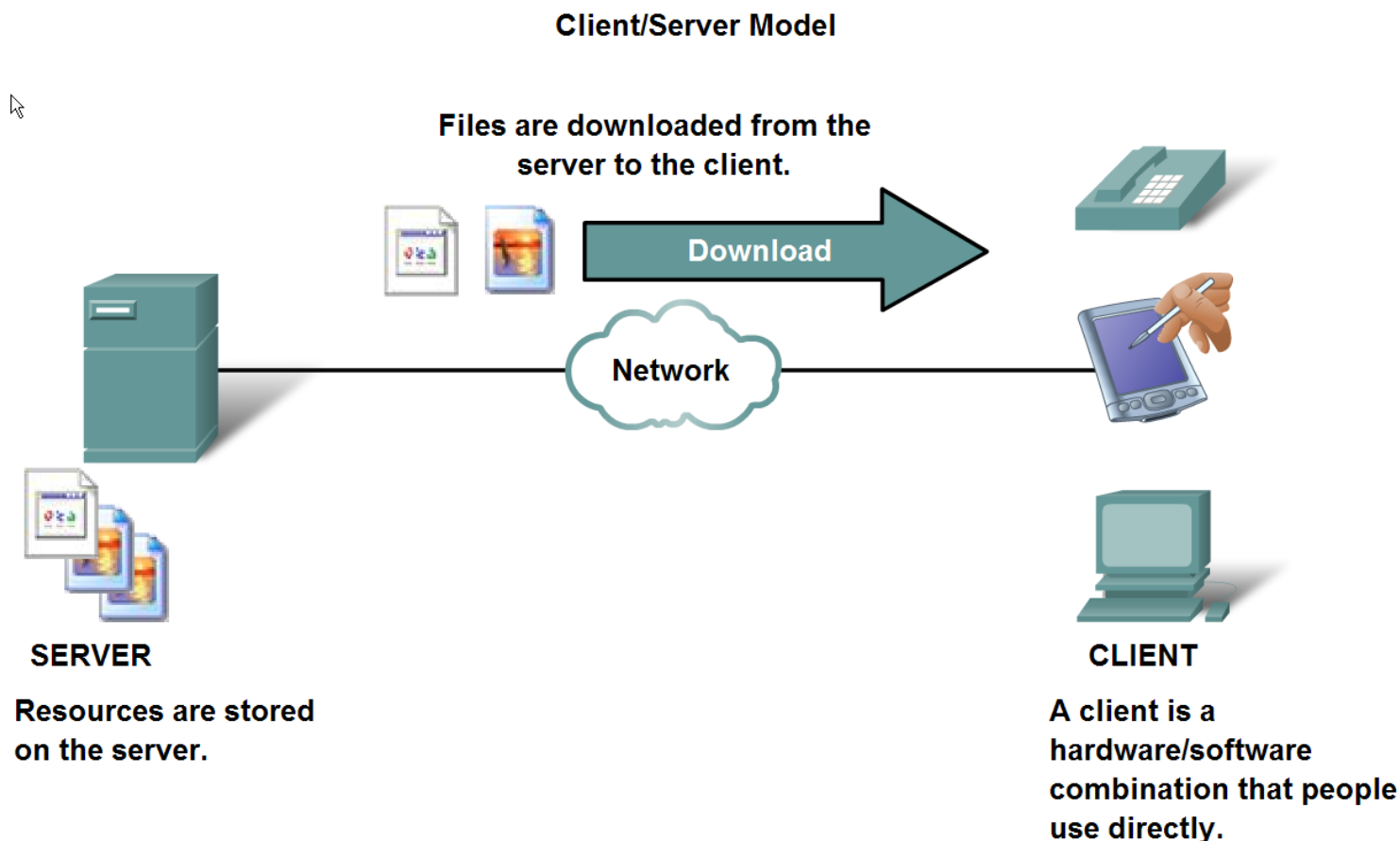
# Applications – The Interface Between Human and Data Networks

- Describe the role protocols play in networking and be able to identify several message properties that can be defined by a protocol



# The Role of Protocols in Supporting Communication

- Describe the roles of client and server processes in data networks

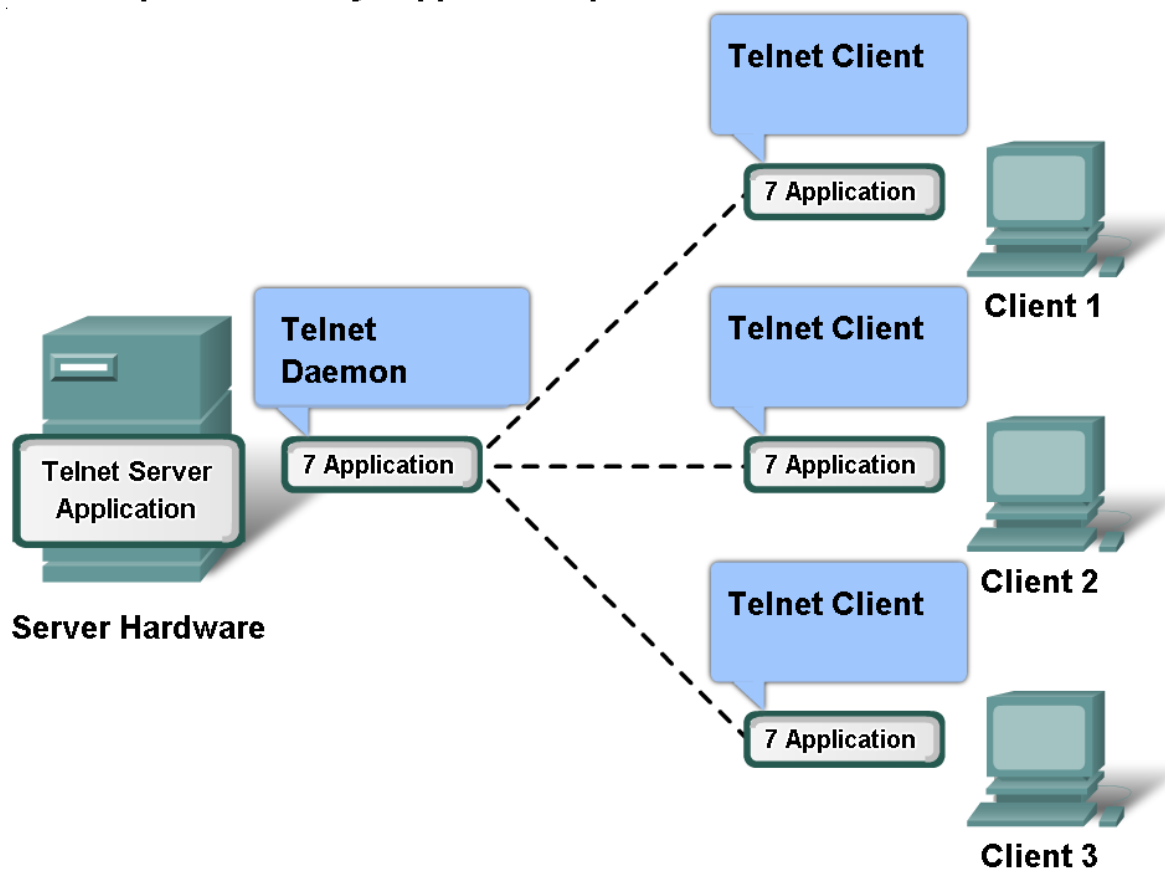




# The Role of Protocols in Supporting Communication

- List common Application Layers services and protocols

Server processes may support multiple clients.



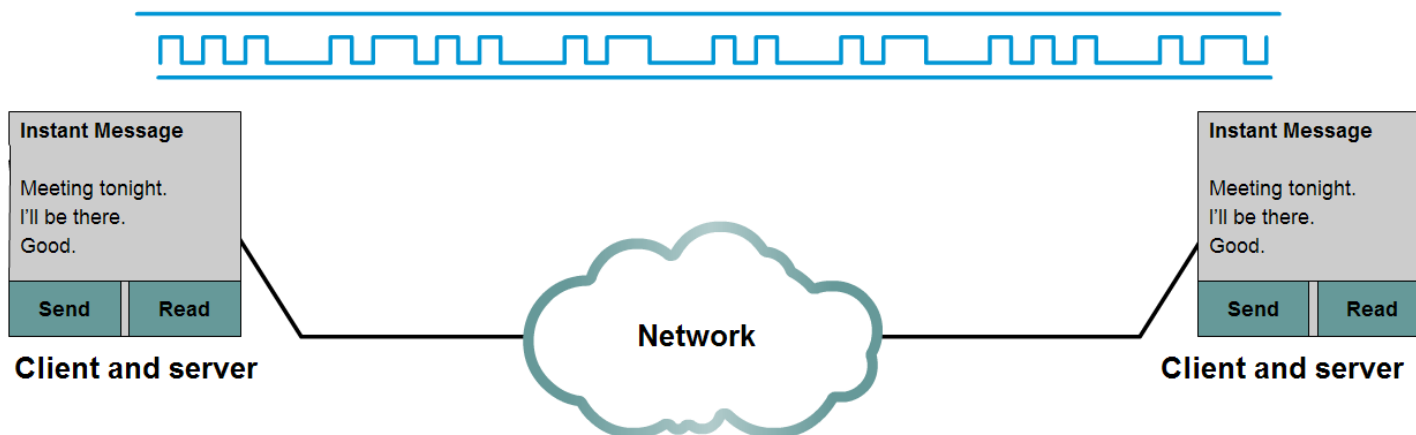


# The Role of Protocols in Supporting Communication

- Compare and contrast client server networking with peer-to-peer networking and peer-to-peer applications

## Peer-to-Peer Applications

Client and server in the same communication



### Both clients:

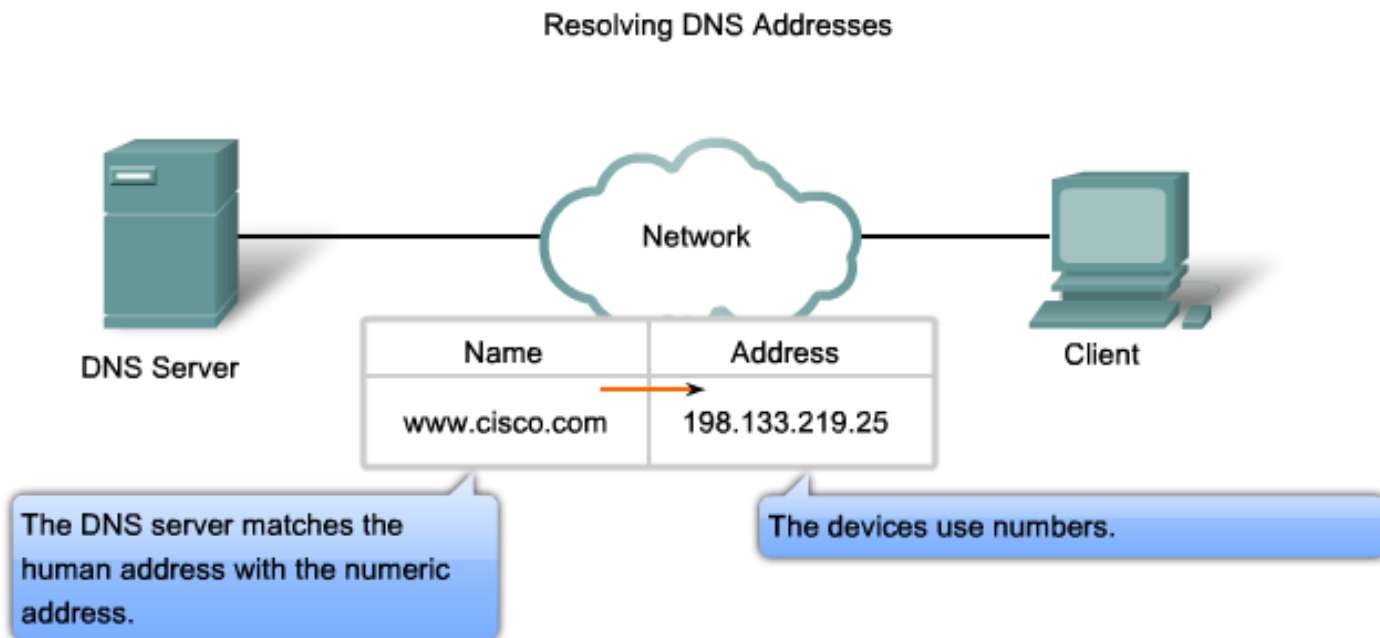
- Initiate a message
- Receive a message

### Both clients simultaneously:

- Send
- Receive

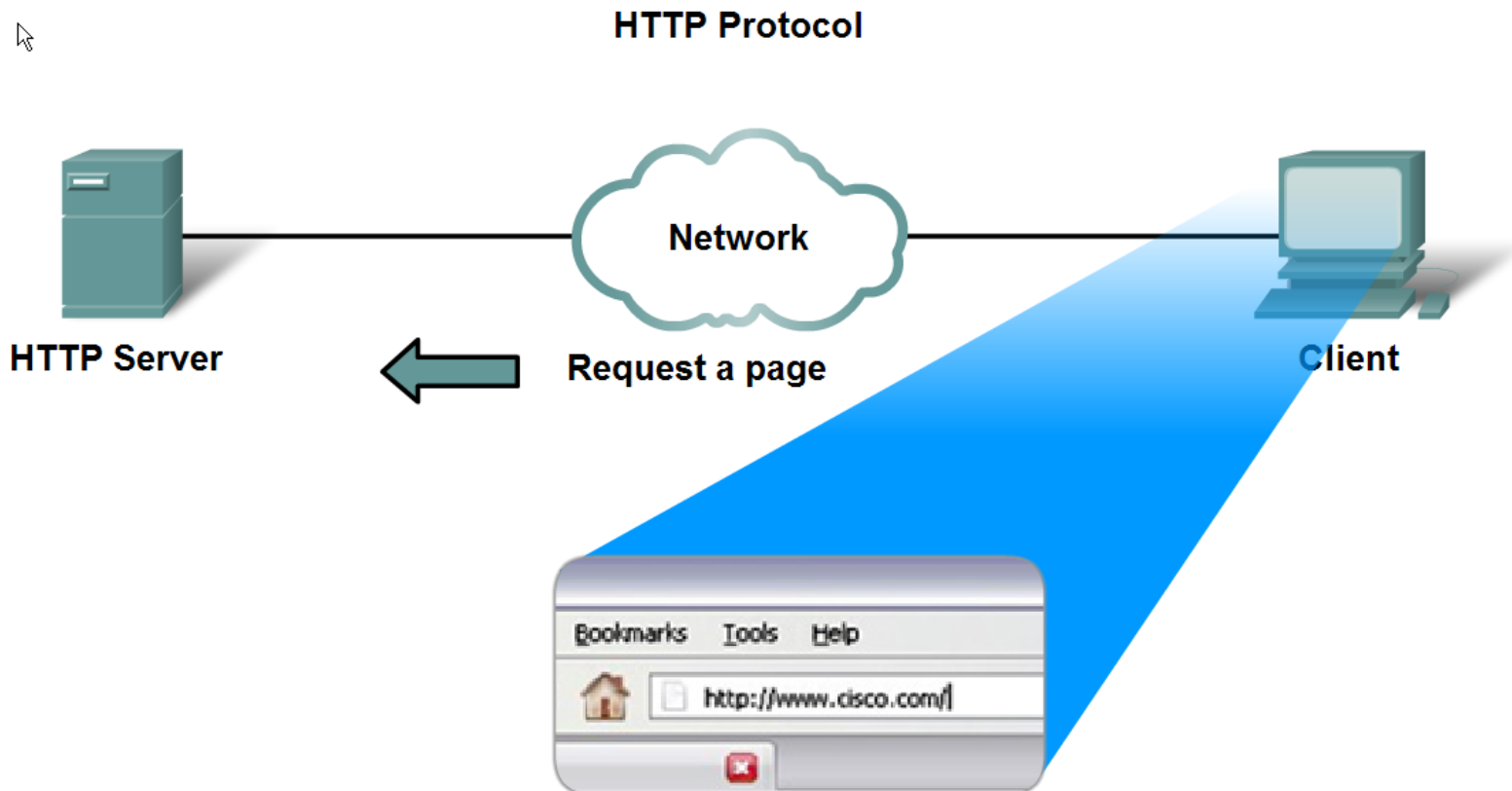
# Features, Operation, and Use of TCP/IP Application Layer Services

- Describe the features of the DNS protocol and how this protocol supports DNS services



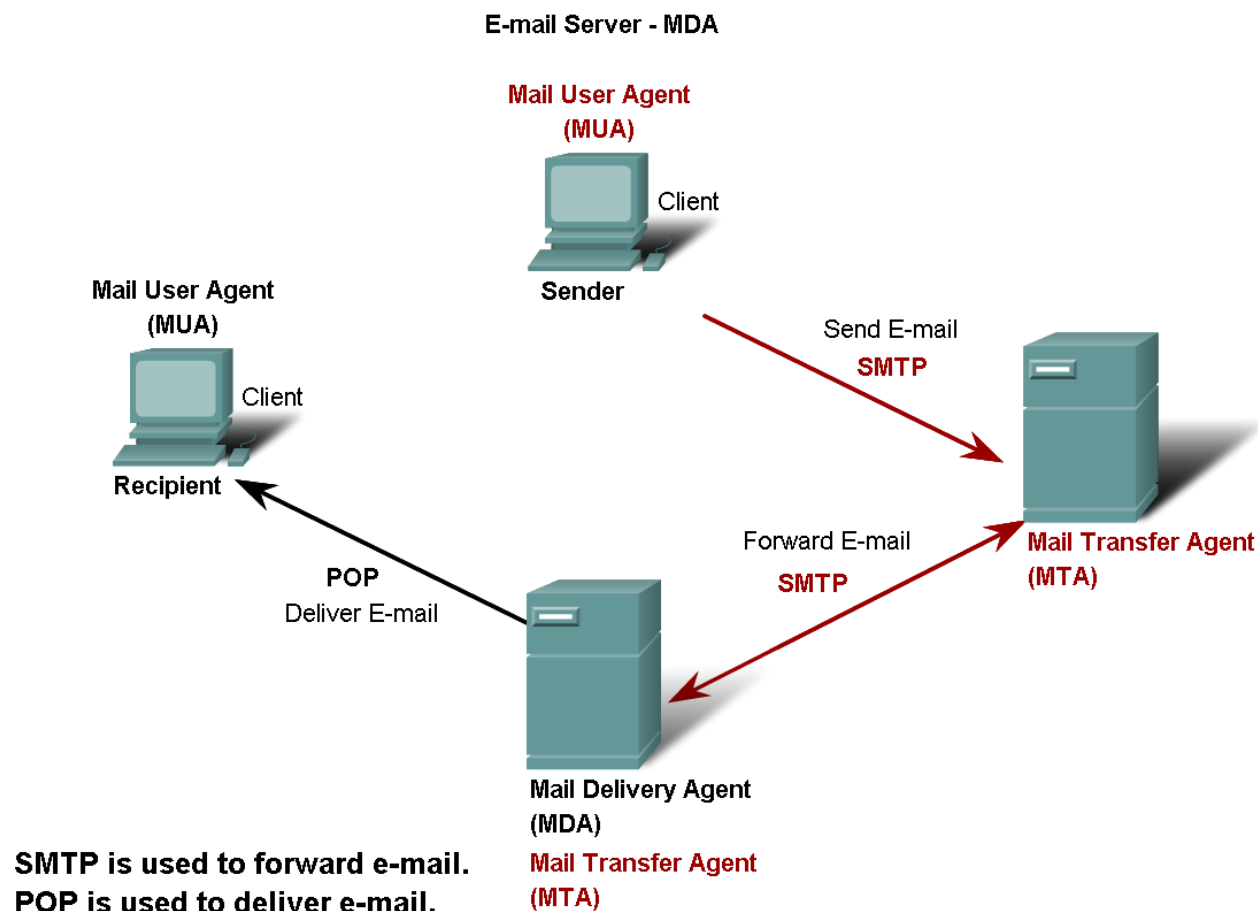
# Features, Operation, and Use of TCP/IP Application Layer Services

- Describe the features of the HTTP protocol and how this protocol supports the delivery of web pages to the client



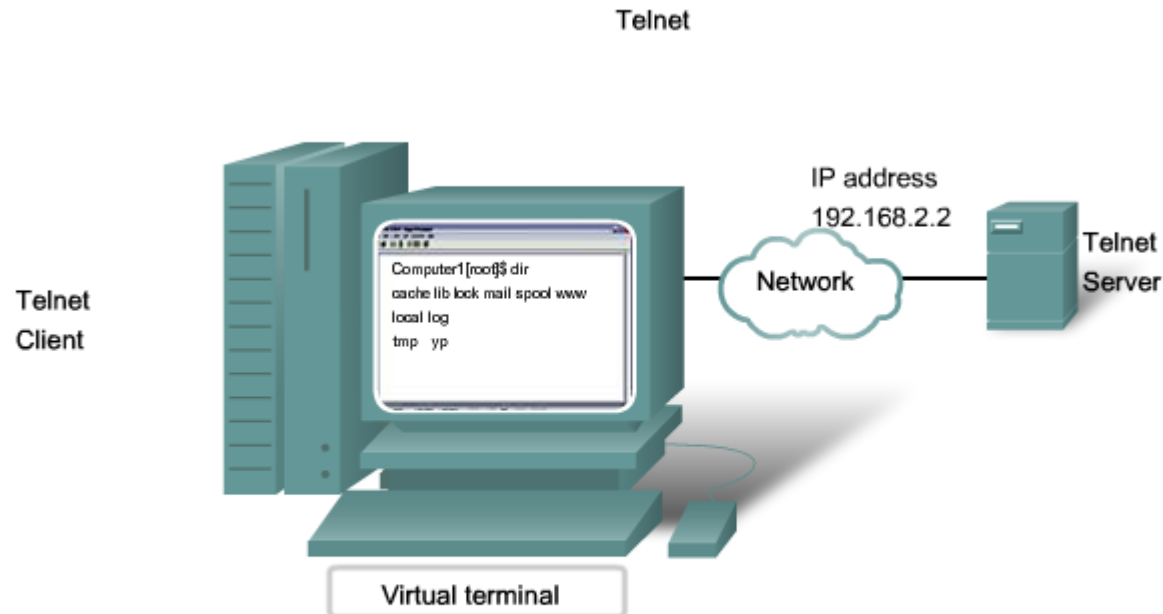
# Features, Operation, and Use of TCP/IP Application Layer Services

- Describe the features of the POP and SMTP protocols, and how these protocols support e-mail services



# Features, Operation, and Use of TCP/IP Application Layer Services

- Describe the features of the Telnet protocol and identify several of its uses in examining and managing networks

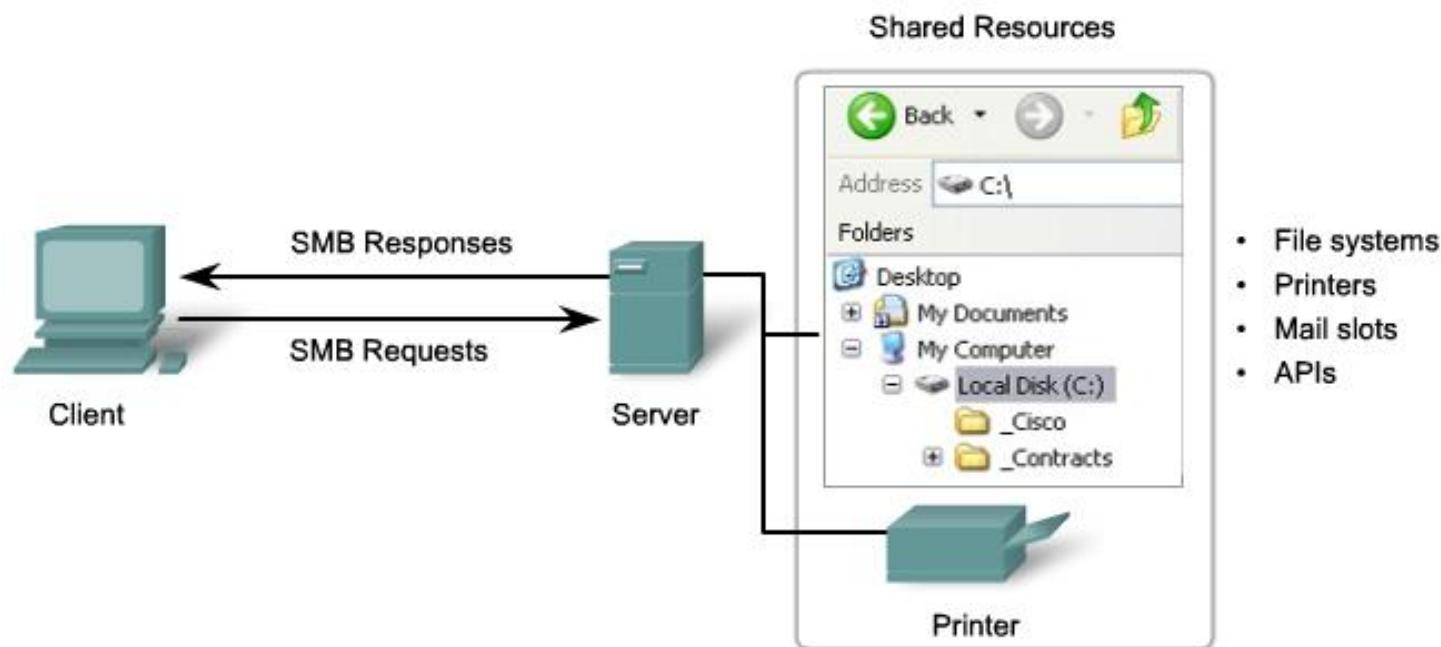


Telnet provides a way to use a computer, connected via the network, to access a network device as if the keyboard and monitor were directly connected to the device.

# Features, Operation, and Use of TCP/IP Application Layer Services

- Describe the features of the SMB protocol and the role it plays in supporting file sharing in Microsoft-based networks

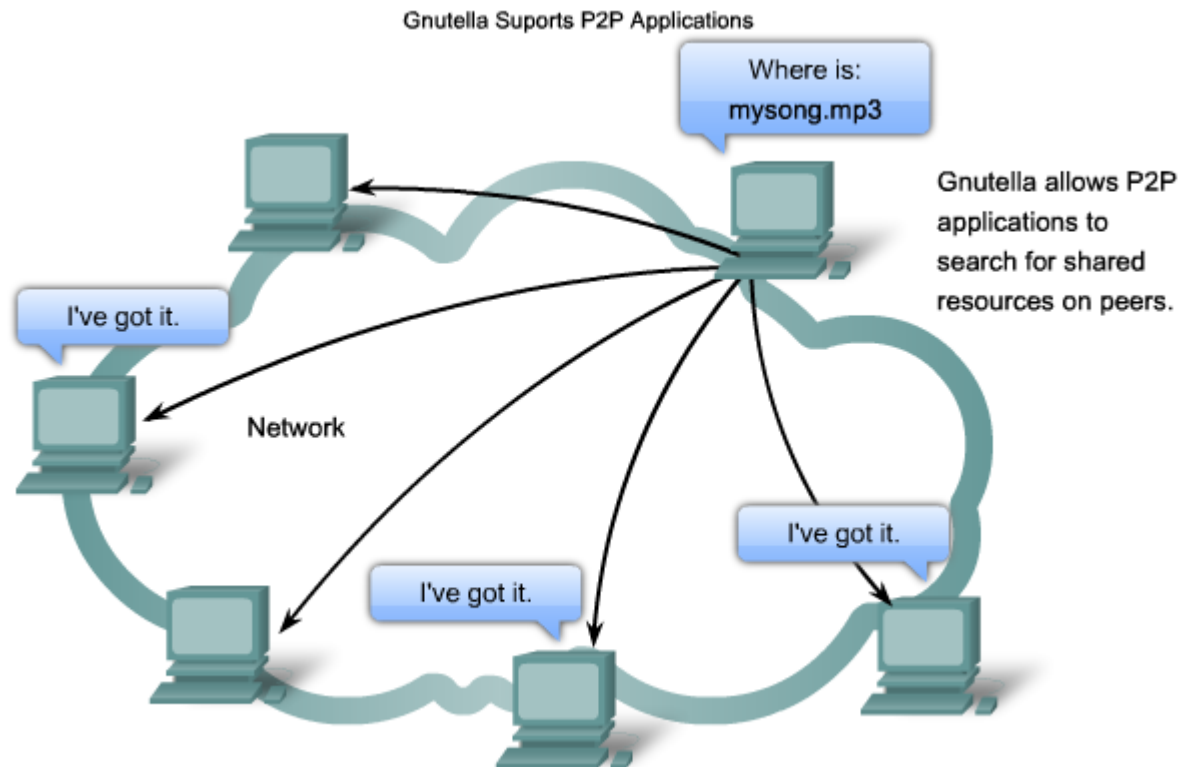
File Sharing Using the SMB Protocol



SMB is a client-server, request-response protocol. Servers can make their resources available to clients on the network.

# Features, Operation, and Use of TCP/IP Application Layer Services

- Describe the features of the Gnutella protocol and the role it plays in supporting P2P services





# Summary

## In this chapter, you learned to:

- Describe how the functions of the three upper OSI model layers provide network services to end user applications.
- Describe how the TCP/IP Application layer protocols provide the services specified by the upper layers of the OSI model.
- Define how people use the Application layer to communicate across the information network.
- Describe the function of well-known TCP/IP applications, such as the World Wide Web and email, and their related services (HTTP, DNS, SMB, DHCP, STMP/POP, and Telnet).
- Describe file-sharing processes that use peer-to-peer applications and the Gnutella protocol.
- Explain how protocols ensure services running on one kind of device can send to and receive data from many different network devices.
- Use network analysis tools to examine and explain how common user applications work.

